

Socio-Economic Significance of Reed Forests in a Rural Community: A Case Study from the Greater Sylhet Region of Bangladesh

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The reed forests that are the subject of this study are scattered over five thanas¹ of the Sunamganj and Sylhet Districts of the Sylhet Division of Bangladesh. Their total area is 23,590 ha and they have great ecological, economic, commercial and socio-economic importance due to the diversified resources they supply. However, the forests are commonly encroached on by local people who are perceived to be seriously depleting the resource. This paper deals with the socio-economic status of the people residing near these reed forests, and examines their dependency on the resources provided by the reed forests. A socio-economic survey, participatory rural appraisal and interviews were used to obtain baseline data of the reed forest resource and the local communities. The study reveals that the communities in the study region have higher income than other areas of Bangladesh. Most survey respondents have other occupations in addition to farming. The literacy rate is 28.8%. Among the illiterate, 68% engage in collecting reeds. Although the Forest Department has a management plan for sustainable use of the reed forests, encroachers receive backing from political leaders and local elites, so their eviction is difficult. In order to achieve long-term productivity and sustainability from the reed forests, this study recommends a strategy of developing an integrated joint management plan between the Forest Department and the local people.

Keywords: wetland, diversity loss, human encroachment, PRA, interview

¹ A *thana* is an administrative unit within a District.

INTRODUCTION

Bangladesh is a densely populated country, situated in the northeastern part of the South Asian subcontinent. Despite a growing awareness of the need for protecting the environment, degradation has occurred rapidly during the last three decades. The country's ecology has been damaged, forests depleted, wetlands destroyed, and biodiversity considerably degraded. As a consequence of population pressure, the reed forests of Bangladesh are also under serious threat with most of the reed forest lands being encroached on by the local people. In recent years, as a direct consequence of agricultural expansion, many wetlands have shrunk or disappeared. Such degradation has brought about a loss of biodiversity, reduction in fish habitat and loss of reed forests that are a valuable source of a wide range of non-timber forest products. Policies are needed for sustainable management of the remaining reed forests. In the past, conflicts have often arisen between the Forest Department and local communities, with the authorities being unsuccessful in evicting encroachers.

Against this background, the current study's main objectives were to explore:

- the existing condition and management of the reed forests of Bangladesh;
- the extent of dependency on reed-land resources and their importance to the socio-economic status of the local people's existence;
- the process and trend of prevailing encroachments and the constraints they bring to reed forest management; and
- appropriate management strategies for the reed forests.

The following section describes the location and nature of reed growing areas in Bangladesh. The research method is then outlined and study findings presented. Finally, some policy implications are drawn for management of reed forests.

THE REED GROWING AREAS OF BANGLADESH

There are 23,590 ha of gazetted reed forest in the haors² and low-lying land areas under the jurisdiction of Sylhet Forest Division. These reed forests are bounded by 24° 81' north latitude and 91°39' - 92°23' east longitudes and scattered over the five thanas of Companiganj, Dowarabazar, Chattak, Gowainghat and Jaintapur in the Sunamganj and Sylhet Districts of Sylhet Division (FMP 1998). The five thanas have a total population of about 0.7 million, and cover an area of 1739 km². The average family size is 4.37 (the national average is 5.5) and the literacy rate of the study area is 28.8% (BBS 1995).

The reed lands are located in the Surma-Kusiyara Floodplain, which contains water for about six months of the year (Chowdhury 2001). This floodplain lies mainly within the Haor Basin of Sylhet, comprising freshwater wetlands, a vast

² A haor is bowl-shaped depression between the natural levees of a river subject to monsoonal flooding. Beels are shallow lakes or a series of ponds remaining after the haors drain out during the dry season.

alluvial plain, numerous rivers and streams and hundreds of shallow depressions over a large area between the natural levees of river. The basin itself is a succession of beels and haors of various sizes, intersected with river cutoffs, swales and long higher levels (Rashid 1991). The haors are flooded to a depth of several metres during the rainy season and in many cases two or more neighbouring haors link up to form large water bodies. In the dry season most of the water drains out leaving *beels*. These shallow, saucer-shaped depressions become overgrown with aquatic vegetation during the dry season (BCAS 1997).

The reed forest area is bounded by a number of rivers and their tributaries. The large Bangladesh Surma River flows through the southern side of the area while the Dhaleswari and Goyain Rivers flow through the eastern side in a southerly direction. The Piyain, Dhala and Chelee Rivers lie on the western side and flow into the Surma River. A number of small rivers and khals cover the whole area. The northern side of the area falls within the Meghalaya plateau foothills, while the southern side is bounded by small hillocks near the Sylhet district. Hilly areas bound the southeast. The surrounding areas of Chattak and Dowara bazaar have small hillocks (Rashid 1991).

The reed forests in freshwater marshes are dominated by a reed type known locally as Pajuban, and consist of grasses 6-7 m tall, of mainly nal (*Phragmites karka*), khagra (*Saccharum spontaneum*) and ekra (*Eranthus ravannae*), as well as meadow grasses including binna (*Vetiveria zizanioides*) and woody shrubs including satamuli (*Asparagus racemosus*). Fresh water swamp forests develop in still water areas around the lake margins and on elevated ridges between the beels or levees of streams and consist of evergreen trees 10-12 m tall including hijal (*Barringtonia acutangula*), koroch (*Pongamia pinnata*), bhuri (*Trewia nudiflora*), jarul (*Lagerstroemia speciosa*), woody shrubs including baladunur (*Ficus heterophylla*) and chitki (*Phyllanthus disticha*), and *Asclepias* climbers. Murta (*Clinogyne dichotoma*), bet (*Calamus* spp.), fish, shingles and boulders are further commercially important non-wood resources of the reed forest (Karim 1993).

The wetlands of Greater Sylhet Region of Bangladesh have great ecological, commercial and socio-economic importance. They are highly productive ecosystems and important breeding grounds for fish (Karim 1993). They serve as a filtering system for polluted water, provide fertile soils where people can grow a wide range of staple foods and provide grazing areas and fuel. The dynamic interaction of terrestrial and aquatic systems makes these wetlands highly valuable environmentally. The reed forests are rich in their diversity of fauna, and are internationally important wetland habitats for migratory waterfowls, particularly for ducks and shore birds. The wetlands are recognised as containing very rich components of biodiversity of local, regional and national significance (Nishat 1993).

Encroachments, indiscriminate cutting of reeds for use as building and industrial raw materials and fuel, unsustainable harvest of animal species and grazing have extensively damaged the reed forests. Reed forests comprising about 2400 ha were allocated to the Sylhet Pulp and Paper Mills (SPPM) for supply of fibrous raw materials in 1975 (FMP 1998). However, by the time the mill was commissioned, the reed resources had become depleted due to encroachments for settlements and cultivation.

RESEARCH METHOD

The study was carried out over a period of six months, from July to December 2002, and included a survey using a semi-structured questionnaire, and participatory rural appraisal (PRA) using key informants. The study area was chosen as typical of wetlands in Bangladesh and for having a wide diversity of resources. It included the thana of Companigonj, Dowarabazar, Chattak, Gowainghat and Jaintapur of the greater Sylhet region. Since the sample was drawn from villages near and within reed forests, the inhabitants were presumed likely to use reeds from and possibly encroach on the government forestlands. A multi-stage sampling technique was used, with villages treated as primary sampling units. Twelve villages from each thana were selected for sample collection. A 10% sample (60 of the 600 households in the study area) was drawn randomly, and interviews conducted at residences of the respondents.

The questionnaire sought information about the way the local people create their livelihood, the way they utilise the reed forests, and the contribution the reed forests make to their socio-economic well-being. Questions were designed to obtain profiles of the household heads (ethnicity, ages, religion and occupation), and family members (number of family members, age, living standards, incomes, family land holdings and education) and of migration patterns.

After the survey, participatory rural appraisal was used to obtain opinions of the people residing near and within reed lands. An unstructured outline or interview guide that sought information about relationships between groups (ethnicity, gender, economic and other groups), motivations of those encroaching on the reed forests and attitudes of non-resident encroachers towards sustainable management and development, was prepared for PRA. Ten sites (two from each thana) were selected. The key informants were selected from local leaders. They included schoolteachers, religious leaders, the chairman and members of the Union Parishad (the lowest administrative unit of government), elders and elite persons of the society and members of the Forest Department. Face-to-face interviews were conducted to collect types of information not readily available from villagers and were carried out after a daylong informal group workshop. The qualitative data of PRA were analysed taking into consideration the explicit and implicit meaning of the verbal statements using the method outlined by Woodhill and Robins (1998).

RESEARCH FINDINGS

Socio-Economic Status of the Reed Forest Dwellers

Respondents in the village survey were mostly Muslim and most between 31 to 50 years of age ($n = 60$). About 90% of respondents were married and 71% were illiterate. The primary occupation of most people was day-wage labour (36%), followed by farming (27%) and small business (16%). Most of the respondents had a second occupation. Farming was the most common second occupation (49%), followed by wage labour (18%), business (8%), reed extraction (6%) and fishing (3%).

Villagers reported that cultivated lands around the reed lands have low productivity and many subsidise their family income by wage labour. This could be

the major reason for so many respondents having a non-farm occupation. The mean family size was about 4.37, somewhat lower than the national mean of 5.5 (BBS 1995).

A significantly higher proportion of males contribute to family income than females of the same age. The reason for lower female involvement could be a definitional issue, because the survey definition does not consider familial roles – such as processing rice, working in kitchens, gardening and rendering service to family members – as economic activities. It was found that the women's labour force participation rate was only 6%. In contrast, males above 10 years had a participation rate of 99%, which is higher than the national average of 77% (BBS 1994).

Table 1 shows the size distribution of landholdings owned by respondents. Over one-third were landless according to the definition of government (BCAS 1997), having a land area of 0.202 ha or less. About 40% of the respondents owned between 0.206 ha and 2.024 ha of land. Sample families owned more farmland (mean 0.88 ha) than non-farm lands (mean 0.30 ha). Most of the land is at the foothills, has low fertility and is capable of producing only one crop per year. Hence the returns from crops grown in these areas are low compared to the fertile areas on which the reed forests grow.

Table 1. Size distribution of land ownership of respondents

Land size (ha)	Respondents owning farm land		Respondents owning non-farm land	
	Number	Percentage	Number	Percentage
0.000-0.202	20	41.7	25	59.5
0.203-0.404	5	10.4	6	14.3
0.405-0.809	6	12.5	7	16.6
0.810-1.209	4	8.3	2	4.8
1.210-2.024	7	14.6	1	2.4
2.025 or more	6	12.5	1	2.4
Total	48	100.0	42	100.0

Despite the low quality of the land, the people of the sample areas had a higher income (US\$450) than the national average per capita income of US\$300 (BBS 1998). This was achieved through the villagers also having other sources of income such as stone collection, wage labour, business, remittances from abroad, income of other family members, extraction of reeds, fishing, service and rent from carts and rickshaws. The farm income of the respondents in fact accounted for 43% of their total income (Table 2). This is unlike the population of most rural areas of Bangladesh where dependency on agriculture is high.

Table 2. Distribution of sources of annual income

Income (US\$)	Income from all sources ^a		Income from farming ^a		Income from wages ^a	
	No.	%	No.	%	No.	%
0-87	2	3.3	26	48.1	23	53.5
88-175	1	1.7	9	16.7	2	4.7
176-350	5	8.3	9	16.7	8	18.6
351-526	10	16.7	5	9.3	4	9.3
527-701	17	28.3	2	3.7	4	9.3
702-877	10	16.7	1	1.8	1	2.3
878-1052	15	25.0	2	3.7	1	2.3
Total	60	100.0	54	100.0	43	100.0
Mean income	US\$450		US\$195		US\$206	

Relation Between Collections of Reeds and Socio-Demographic Variables

A number of bivariate analyses have been carried out on the survey data to investigate the linkage of reed collection and socio-demographic variables. Table 3 indicates that 68% of illiterate people collect reeds, 40% who have secondary education collect reeds and 27% who have post-secondary education collect reeds. A χ^2 test indicates that education has a clear link with reed collection; the higher the education the lower the proportion collecting reeds.

Table 3. Distribution frequency of reed collection by literacy level

Reed collection category	Literacy level				Total
	Illiterate	Primary education	Secondary education	Post- secondary	
Collect reeds	54(41.14) 68%	25(26.83) 55%	13(19.08) 40%	4(8.95) 27%	96 60%
Do not collect reeds	15(27.86) 32%	20(18.17) 45%	19(12.91) 60%	11(6.06) 73%	65 40%
Total	79	45	32	15	161

Note: Values in parentheses are expected frequencies under independence of classifications.
Calculated $\chi^2 = 21.84$ and tabulated $\chi^2 = 7.81$, df 3 at P=0.05.

The tendency to collect reeds also appears to be related to occupation. Table 4 shows that more than 60% of farmers, wage earners, small business operators and fishers collect reeds, compared with 40% of those in the service industry.

Table 4. Distribution frequency of reed collection by occupation

Reed collection category	Primary occupation						Total
	Farming	Wage labour	Small business	Service	Fishing	Others	
Collect reeds	37(36.64) 64%	48(46.12) 66%	23(24.00) 61%	4(6.32) 40%	29(27.81) 66%	10(10.11) 63%	151 63%
Don't Collect	21(21.36) 36%	25(26.88) 34%	15(13.99) 39%	6 (3.68) 60%	15(16.20) 34%	6(5.89) 37%	88 37%
Total	58	73	38	10	44	16	239

Note: Values in parentheses indicate expected frequencies under assumption of independence.
Calculated $\chi^2 = 2.79$ and tabulated $\chi^2 = 11.10$, df 5 at P<0.05.

Utilisation of Reed Resources

PRA discussions revealed that about 90% of the people in and around the reed lands use reed resources for family fuelwood consumption, the extent depending on economic status. The general observation is that the well-off people do not live around reed forests. (Perhaps because reed lands areas are low lying and not a pleasant place to live during the rainy season). The PRA indicated that most villagers derive their livelihood from stone collection activities, small-scale cultivation and wage labour. This is consistent with the findings of the survey of villagers. All of these categories of people use the reed resources as house construction materials, fuel and fodder.

A large number of people are engaged in fishing activity in beels, haors and rivers, though reed resources have little commercial value and few people sell them in markets. It appears that there is little restriction on extracting reeds because almost all participants of PRA, irrespective of their status as encroachers or non-encroachers, collect them for their consumption. It is notable that the reeds do not provide cash benefits to the local people but the entire population depends on them for material benefits, which in monetary terms will be enormous. Any major restriction on reed collecting would have negative consequences upon the lives of people of these areas.

Interest Groups in Relation to Reed Lands

It was believed that interest groups control the encroachment of reed lands, and this was confirmed in the PRA. Influential people have managed to lease some of the reed forest areas from the Deputy Commissioner's Office (district administration office) and have also sub-leased those to some other persons. During the initial stage of settlement the outside encroachers were in conflict with local inhabitants because the newcomers had control over large areas of reeds. In recent years the politicians have used their influence to increase immigration so as to obtain more votes in elections. This has increased the bargaining power of the encroachers in any disputes with the Forest Department. Encroachers have also established political parties, and elected local Members of Parliament who visited their localities and made verbal assurances against eviction. As a result, whenever the Forest Department has attempted to assert their rights over the land, conflict and even violence has erupted between the parties.

Land-use Patterns in Reed Forest Areas

Reed forests are situated mostly in low-lying areas excepting some areas of small hillocks in the surroundings. The high populations of birds, animals and snakes including a large number of migratory birds and animals, have started to diminish with the intrusion of encroachers and subsequent destruction of reeds. A further factor increasing the rate of reed depletion is the increase in waves that form on the baors³ during the wet season. These waves have become more destructive because the shrinking areas of forest afford less protection from the wind. Consequently, there is more damage being caused to the already diminished areas with commensurate decreases in the number of birds and other wildlife. However, the major reasons of depletion of reeds identified by the people are:

- large-scale immigration to the area, and
- silting of beels due to soil erosion from the hills in adjacent areas of India during the rainy season.

A large portion of reed forests has been converted into agricultural land because the encroachers consider it to be more profitable for cropping than other land uses. The majority of the villagers share this opinion. The remaining stands of once dense swamp forests can only be protected by proper land-use management, and there is a need to develop more swamp forests areas through afforestation, with the component trees providing construction materials, fuel, fodder and nesting sites for birds and other animals, as well as acting to control erosion.

Attitudes to Infrastructure Development in Reed Forest Areas

There are mixed opinions about the development of reed-lands. Some villagers are of the opinion that the priority should first be for substantial improvements in the fields of education, health, family planning and drinking water. A large number of participants have pointed out that lack of educational institutions, roads, health care facilities, industries, and alternative occupations are the causes of backwardness of their areas. Many Non-Government Organisations (NGOs) are working in the locality but some communities are suspicious that these NGOs are engaged in anti-Islamic activities.

Community Views about Encroachment in Reed Forest Areas

People of the reed forest areas do not seem to be fully aware of the contribution made by of reed forests to their overall welfare and the consequences of their depletion. It is observed that they are aware of the impact of reed depletion on their personal lives but not of the long-term impact on the environment.

Community Views on Joint Management

In Bangladesh forest policy, forest management is characterised by two major considerations:

- emphasis on obtaining produce from the forests; and
- forest protection through prevention of people encroaching.

³ A baor is a dead arm of a river situated in moribund delta, also called an oxbow lake.

Encroachers are considered by the Forestry Department to be the greatest threat to sustainability of reed-forest resources. Clearly, this puts them fundamentally at odds with the local people who, despite awareness of the effects on their personal lives of reed forest depletion, do not approve the eviction of encroachers and the transformation of converted cropland back to reed land again. They resist any attempt to displace the encroachers or to prevent them from cultivating encroached lands. Eviction of encroachers is almost impossible because of the solidarity between encroachers and the villagers who strongly support maintenance of the status quo.

Though Forest Department policies reflect long-term objectives for productivity and sustainability, compromises will have to be made based on the dynamics of local environment. In order to develop a sound reed forest management system there are several crucial aspects requiring further definition and attention, including:

- land-use classification;
- the biological foundation of sustainable natural productivity;
- community participation;
- the role of the private sector;
- community-based enterprise development;
- rural energy requirements; and
- forestry extension.

People of all walks of life around the reed lands express a readiness to negotiate with the Forest Department with regard to care of the remaining reed lands. However, before this is possible, both groups (Forest Department and villagers) would need to regain each other's trust. In the past, trust has been seriously eroded when political elites were likely to simply side with encroachers and villagers – for their own political interests – rather than seeking to develop a long-term solution. An important consideration, from an ethical viewpoint, is the dilemma of attempting to remove encroachers after they have lived on reed-land forests for many years and have no other place to which they can go.

CONCLUDING COMMENTS

Reed forests in the Greater Sylhet Region of Bangladesh are now being encroached on by immigrants and local villagers alike. A large portion of the encroached area has already been converted to croplands. Prevention of further decline of the reed forests will require adoption of multiple-use land management based on principles of sustainable development. An integrated management plan is needed which includes wood and non-wood products, agriculture, fisheries and conservation of ecosystems for biodiversity of flora and fauna. A core area and a buffer zone would need to be demarcated when allocating land use in reed forests areas. Moreover, public awareness has to be developed for reed forest resource management. It will also be necessary in some areas to relocate the encroachers and place restrictions on the entry of new immigrants. Sustainable management will only be possible if governments undertake participatory management of reed forests involving the stakeholders in and around the reed land areas.

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